

WHAT IS CLAIMED IS:

1. An image reading apparatus comprising:

an image reading unit for scanning and reading an image on a predetermined medium;

5 transmission means for sequentially transmitting image data read by said image reading unit to an external device;

a driver for displacing a relative position between the image and said image reading unit; and

10 a controller for, when image reading operation of said image reading unit suspends, displacing the relative position between the image and said image reading unit by said driver to a predetermined position before the suspended position of the image reading  
15 operation, and restarting reading operation from the predetermined position.

2. The apparatus according to claim 1 further comprising monitoring means for monitoring whether the external device can receive data,

20 wherein said controller suspends reading operation when said monitoring means detects that the external device cannot receive data during execution of reading operation of said image reading unit.

3. The apparatus according to claim 2, wherein said  
25 monitoring means determines based on a signal from the external device whether the external device can receive data.

4. The apparatus according to claim 1, wherein the predetermined position is set in consideration of a distance by which acceleration of said driver ends and a moving speed becomes constant.
- 5 5. The apparatus according to claim 1, wherein the predetermined position includes a home position.
6. The apparatus according to claim 1 further comprising area designation means for designating a desired image area on the predetermined medium,
- 10 wherein said image reading unit scans and reads the image area of the predetermined medium designated by said area designation means.
7. The apparatus according to claim 6, wherein the predetermined position is set to a position before an
- 15 image scan start position of the desired image area designated by said area designation means in consideration of a distance by which acceleration of said driver ends and a moving speed becomes constant until the relative position between the image and said
- 20 image reading unit reaches the image scan start position of the desired image area.
8. The apparatus according to claim 7, wherein the predetermined position is changed depending on the image scan start position of the desired image area
- 25 designated by said area designation means.
9. The apparatus according to claim 1 further comprising memory for temporarily storing the image

data read by said image reading unit,

wherein the image data read by said image reading unit are sequentially stored in said memory, and said transmission means sequentially transmits the image data stored in said memory to the external device.

10. The apparatus according to claim 9 further comprising available capacity detection means for detecting an available capacity of said memory,

wherein said controller suspends reading operation of said image reading unit when the external device cannot receive data and the available capacity of said memory decreases to less than a predetermined capacity.

11. The apparatus according to claim 9, wherein said memory can successively store image data in an area where image data which have been transmitted to the external device are stored.

12. The apparatus according to claim 10, wherein when reading operation of said image reading unit suspends, said controller waits until the available capacity of said memory increases, then reading operation of said image reading unit restarts from the predetermined position.

13. The apparatus according to claim 9 further comprising data discard means for discarding image data which have been stored in said memory by reading operation when the reading operation of said image

reading unit suspends.

14. The apparatus according to claim 1, wherein said driver moves said image reading unit while said image reading unit scans and reads the image on the  
5 predetermined medium.

15. The apparatus according to claim 6, wherein said driver moves said image reading unit while said image reading unit scans and reads the image on the predetermined medium.

10 16. The apparatus according to claim 1, wherein the predetermined medium is illuminated to input optical information to said image reading unit, said image reading unit is fixed, and said driver changes an optical path of the optical information, thereby  
15 causing said image reading unit to scan and read the image on the predetermined medium.

17. The apparatus according to claim 6, wherein the predetermined medium is illuminated to input optical information to said image reading unit, said image  
20 reading unit is fixed, and said driver changes an optical path of the optical information, thereby causing said image reading unit to scan and read the desired image area of the predetermined medium.

18. The apparatus according to claim 1 further  
25 comprising notification means for notifying the external device of a suspension notification when reading operation of said image reading unit suspends.

19. The apparatus according to claim 18, wherein said notification means notifies the external device of the suspension notification and a discard instruction of discarding image data which have been transmitted by  
5 image reading operation.

20. The apparatus according to claim 1 further comprising notification means for notifying the external device of a restart enable notification when reading operation of said image reading unit can  
10 restart.

21. The apparatus according to claim 1, wherein the predetermined medium includes a microfilm.

22. The apparatus according to claim 21 further comprises a display on which an image on the microfilm  
15 is projected, and

said image reading unit scans and reads the image projected on said display.

23. An image reading method of scanning and reading the image by displacing a relative position between an  
20 image on a predetermined medium and an image reading unit by a driver, and sequentially transmitting image data read by the image reading unit to an external device, comprising:

the displacement step of, when image reading  
25 operation of the image reading unit suspends, displacing the relative position between the image and the image reading unit to a predetermined position

before the suspended position of the image reading operation by the driver; and

the reading restart step of restarting reading operation from the predetermined position displaced in the displacement step.

24. The method according to claim 23 further comprising:

the monitoring step of monitoring whether the external device can receive data; and

the suspension step of suspending reading operation when data reception of the external device is detected to be impossible in the monitoring step during execution of reading operation of the image reading unit.

25. The method according to claim 24, wherein in the monitoring step, whether the external device can receive data is determined based on a signal from the external device.

26. The method according to claim 23, wherein the predetermined position is set in consideration of a distance by which acceleration of the driver ends and a moving speed becomes constant.

27. The method according to claim 23, wherein the predetermined position includes a home position.

28. The method according to claim 23, further comprising the designation step of designating desired image area of the predetermined medium,

wherein the designated desired image area is read by the image reading unit, and the predetermined position is set to a position before an image scan start position of the desired image area designated in the designation step in consideration of a distance by which acceleration of the driver ends and a moving speed becomes constant until the relative position between the image and the image reading unit reaches the image scan start position of the desired image area.

29. The method according to claim 28, wherein the predetermined position is changed depending on the image scan start position of the desired image area designated in the designation step.

30. The method according to claim 23 further comprises the storage step of temporarily storing the image data read by the image reading unit in memory, wherein the image data read by the image reading unit are sequentially stored in the memory, and the image data stored in the storage step are sequentially transmitted to the external device.

31. The method according to claim 30 further comprising:

the available capacity detection step of detecting a available capacity of the memory; and the suspension step of suspending reading operation of the image reading unit when the external device cannot receive data and the available capacity

of the memory decreases to less than a predetermined capacity.

32. The method according to claim 30, wherein in the storage step, image data can be successively stored in an area where image data which have been transmitted to the external device are stored.

33. The method according to claim 31, wherein in the reading restart step, when reading operation of the image reading unit suspends, the available capacity in the memory is waited to increase, then reading operation of the image reading unit restarts from the predetermined position.

34. The method according to claim 30 further comprising the data discard step of discarding image data stored in the storage step by reading operation when the reading operation of the image reading unit suspends.

35. The method according to claim 23 further comprising the notification step of notifying the external device of a suspension notification when reading operation of the image reading unit suspends.

36. The method according to claim 35, wherein, in the notification step, a discard instruction of discarding image data transmitted by image reading operation is also notified to the external device.

37. The method according to claim 23 further comprising the notification step of notifying the



external device of a restart enable notification when reading operation of the image reading unit can restart.

38. The method according to claim 23, wherein the predetermined medium includes a microfilm.

5 39. The method according to claim 38 further comprising

the display step of projecting an image of the microfilm,

10 wherein the image reading unit scans and reads the image projected in the display step.

40. A computer program product comprising a computer usable medium having computer readable program code means embodied in said medium for scanning and reading the image by displacing a relative position between an  
15 image on a predetermined medium and an image reading unit by a driver, and sequentially transmitting image data read by the image reading unit to an external device, said product including:

first computer readable program code means for,  
20 when image reading operation of the image reading unit suspends, displacing the relative position between the image and the image reading unit to a predetermined position before the suspended position of the image reading operation by the driver; and

25 second computer readable program code means for restarting reading operation from the predetermined position.